REMARKS

Claims 1-36 are pending in the present application. Claims 1-36 have been rejected. Claims 1, 6, 8, 14, 17-19, 22-25, 28-29, and 32 have been amended. Support for the amendments herein presented can be found in the specification and claims as filed. No new matter has been introduced by these amendments. Reconsideration and allowance is respectfully requested in view of the amendments and the following remarks.

Claims 1-36 have been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. The Examiner states that "it is unclear in the claims where the voids are...". Applicant has amended the claims to more clearly define the invention. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 1-36 have been rejected under 35 U.S.C. § 102(e), as being anticipated by Ozmat (U.S. Patent No. 6,196,307 B1). Applicants respectfully disagree with the Examiner's contentions.

To anticipate a claim under 35 U.S.C. § 102, a single source must contain all of the elements of the claim. *Lewmar Marine Inc. v. Barient, Inc.*, 827 F.2d 744, 747, 3 U.S.P.Q.2d 1766, 1768 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 1007 (1988). Moreover, the single source must disclose all of the claimed elements "arranged as in the claim." *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984).

Ozmat teaches a heat exchanger which comprises a metal foam. (Abstract) The only reference to the use of diamond deposition appears in Column 4, lines 24-27. However, it is known in the art that diamond will not adhere to copper or silver. Therefore, a diamond deposition process will not work with the Ozmat invention.

Additionally, it is known in the art that silver foam and copper foam can not withstand the temperatures utilized in the diamond deposition processes.

Ozmat does not teach as claimed in Claims 1, 8, and 32, "a ceramic framework material substrate", nor as claimed in Claims 17 and 23, "a ceramic open-cell foam substrate". Ozmat does not teach or suggest the use of a ceramic substrate to which diamond is deposited.

Since Ozmat does not disclose all the elements of Claim 1, 8, 17, 23, and 32, the present application is not anticipated by Ozmat. Therefore, dependent Claims 2-7, 9-16, 18-22, 24-31, and 33-36 are also not anticipated by Ozmat. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 1-36 have been rejected under 35 U.S.C. § 102(b), as being anticipated by Zimmer (U.S. Patent No. 5,921,856) or Christianson et al. (U.S. Patent No. 5,910,471) or Hecht (U.S. Patent No. 5,654,059) or Kirchhoff et al. (U.S. Patent No. 5,431,800) or Lemelson (4,960,643). Applicants respectfully disagree with the Examiner's assertions.

As stated above, to anticipate a claim under 35 U.S.C. § 102, a single source must contain all of the elements of the claim. *Lewmar Marine Inc. v. Barient, Inc.*, 827 F.2d 744, 747, 3 U.S.P.Q.2d 1766, 1768 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 1007 (1988). Moreover, the single source must disclose all of the claimed elements "arranged as in the claim." *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984).

Zimmer teaches a flat substrate polishing pad conditioning head for a chemical-mechanical-planarization apparatus. The polishing pad conditioning head comprises a suitable substrate, a diamond grit that is evenly distributed over the surface of the substrate and a CVD diamond grown onto the diamond grit and the substrate so that the diamond grit becomes encased in the CVD diamond and bonded to the surface of the substrate. (Abstract) Zimmer teaches the deposition of the CVD diamond to the surface of the substrate. Zimmer does not teach as recited in Claim 1 "diamond deposited on a ceramic framework material substrate" which is "at least partially filled with a filler

material". There is no porosity in the substrate of Zimmer; Zimmer merely coats the substrate. Since Zimmer does not teach each and every element of the claims, the Examiner has failed to make a *prima facie* case of anticipation. Applicant respectfully requests withdrawal of this rejection and reconsideration.

Christianson, et al. teaches an abrasive article that comprises a backing and at least one three-dimensional abrasive coating comprising diamond particles dispersed within a binder bonded to a surface of the backing, the binder comprising a cured binder precursor including a urethane acrylate oligomer. (Abstract) Christianson, et al. teaches the deposition of the diamond particles disposed within a binder to the surface of the backing. Christianson does not teach as recited in Claim 1 "diamond deposited on a ceramic framework material substrate" which is "at least partially filled with a filler material". There is no porosity in the substrate of Christianson, et al.; Christianson, et al. merely coats the backing. Since Christianson, et al. do not teach each and every element of the claims, the Examiner has failed to make a *prima facie* case of anticipation. Applicant respectfully requests withdrawal of this rejection and reconsideration.

Hecht teaches the fabrication of thick, three-dimensional structures comprising discontinuous thermoset pitch fiber, and to composites comprising such structures embedded in a matrix material such as a thermoset resin, ceramic, metal or carbon. Carbon-carbon fiber composite articles produced from porous carbon preforms obtained by carbonizing such structures followed by infiltration with pyrolytic carbon using CVD processes exhibit surprisingly high through-thickness thermal conductivity and isotropic properties. (Abstract) Hecht teaches a substrate that is a carbon-carbon fiber composite (i.e., a cloth). Hecht does not teach as recited in Claim 1 "a ceramic framework material substrate". Since Hecht do not teach each and every element of the claims, the Examiner has failed to make a *prima facie* case of anticipation. Applicant respectfully requests withdrawal of this rejection and reconsideration.

Kirchhoff, et al. teaches a method for the preparation of layered electrodes, including ultramicroelectrodes, through application of a thin film coating of an inorganic material to a conductor by use of chemical vapor deposition. The chemical vapor

deposition techniques provide a layered electrode that is efficiently and effectively manufactured in a standard reaction chamber at atmospheric pressure. The preferred conductors are carbon fibers and foams, and metal (platinum or gold) wires, meshes and foams. The precursors for the thin film deposition include those that yield thin-films of insulators, semiconductors, metals, and superconductors. (Abstract) Kirchhoff, et al. teaches conductors that are carbon fibers and foams, and metal (platinum or gold) wires, meshes and foams. Kirchhoff, et al. does not teach as recited in Claim 1 "a ceramic framework material substrate". Since Kirchhoff, et al. do not teach each and every element of the claims, the Examiner has failed to make a *prima facie* case of anticipation. Applicant respectfully requests withdrawal of this rejection and reconsideration.

Lemelson teaches composite materials that are in the form of particles, such as bits and short filaments, and combinations of such particles with matrix materials forming high strength, wear and corrosion resistant materials and may be shaped to define cutting tools, dies, mold components, electrodes, bearing components, finishing tools and the like. Structures include substrates and synthetic diamond particles encapsulated therein or bonded thereto have superior grinding, cutting and finishing characteristics. Particles are in the form of microbits, spheroids, single crystals, short narrow filaments and metal whiskers coated with synthetic diamond formed with a core of graphite, metal, metal compounds, metal alloys, ceramic, cermet, glass and composites thereof. Filaments and bits are coated with a lubricating film of wear resistant metal. (Abstract)

In order to be prior art under 35 U.S.C. § 102, the cited prior art reference must teach one of ordinary skill in the art to make the claimed invention. A prior art reference may yet be held not to legally anticipate the claimed subject matter if it is found not to be sufficiently enabling, in other words, if it does not place the subject matter of the claims within the possession of the public. *In re Wilder*, 429 F.2d 447, 166 USPQ 545, 548 (C.C.P.A. 1970). Thus, a prior art reference, including a printed publication, must be enabling as required for U.S. patents under 35 U.S.C. § 112, first paragraph. *Paperless Accounting, Inc. v. Bay Area Rapid Transit Sys.*, 804 F.2d 659, 665, 231 USPQ 649, 653 (Fed. Cir. 1986), *cert. denied*, 480 U.S. 933 (1987). Additionally, if the reference is

inoperative with respect to the claimed invention, then the reference does not teach the invention and is not useable prior art. *In re Shepherd*, 80 USPQ at 497. The Lemelson patent is not enabling, and is therefore not acceptable prior art under 35 U.S.C. § 102 and 35 U.S.C. § 112, first paragraph.

The Lemelson patent teaches the deposition of diamond within open-cell or closed-cell materials. However, the Lemelson patent is not enabling as of the filing date of March 31, 1987. The diamond deposition process as disclosed by Lemelson is not operable. Attached to this document is an affidavit of J. Michael Pinneo stating that he has reviewed the Lemelson patent and asserts that the Lemelson patent is not enabling for the deposition of diamond within open- or closed- cell materials. The following presents a summary of that affidavit.

"Lemelson's teaching does not disclose or imply operable means of diamond deposition that could yield his claimed result. A person skilled in the art following Lemelson's teaching would direct microwave energy through the substrate material, as taught in Column 8, lines 42-45, inclusive. This would produce either of two results depending on the electrical properties of the substrate, neither of which would include the growth of diamond."

"In the first case, for substrates with substantial electrical conductivity, microwave radiation would simply reflect from the substrate material, without the production of a plasma that is a requirement for microwave-assisted diamond deposition. No diamond deposition would occur, either within the interior voids or on the surface."

"In the second case, for substrates with little or no electrical conductivity, microwaves would traverse the material, heating it through a combination of dielectric losses and plasma heating, depending on the nature of the material and size and disposition of internal void volumes. In this event, the material temperature would rapidly exceed the temperature at which diamond deposition is possible. Under these conditions, only graphite would be deposited, and then only if the substrate material could withstand the extreme temperature that would result."

In view of J. Michael Pinneo's affidavit, the Lemelson patent is not enabling under 35 U.S.C. § 112, first paragraph and 35 U.S.C. § 102, and is therefore, not acceptable prior art for use against the present application.

Reconsideration and withdrawal of these § 102(b) rejections is respectfully requested.

In view of the foregoing, consideration and an early allowance of this application are earnestly solicited.

Respectfully submitted,
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VERSION WITH MARKED-UP CHANGES:

In the Claims:

1. (Amended) An article comprising diamond deposited on a ceramic framework material substrate, said article at least partially filled with a filler material.

6. (Amended) The article of claim 1 wherein said filler material substantially completely fills voids in said [article]framework material substrate.

8. (Amended) An article comprising diamond doped with non-diamond material deposited on a ceramic framework material substrate.

14. (Amended) The article of claim 13 wherein said filler material substantially completely fills voids in said [article]framework material substrate.

17. (Amended) An article comprising diamond deposited on a ceramic open-cell foam substrate, said [article]open-cell foam substrate having voids therein, said voids at least partially filled with a filler material.

18. (Amended) The article of claim 17 wherein said [framework material]open-cell foam substrate comprises a material compatible with a diamond deposition process.

19. (Amended) The article of claim 17 wherein said [framework material]open-cell foam substrate comprises a material incompatible with a diamond deposition process coated with a material compatible with a diamond deposition process.

22. (Amended) The article of claim 17 wherein said filler material substantially completely fills said voids [in said article].

23. (Amended) An article comprising diamond doped with non-diamond material deposited on a ceramic open-cell foam substrate, said [article]open-cell foam substrate having voids therein.

24. (Amended) The article of claim 23 wherein said [framework material] open-cell foam substrate comprises a material compatible with a diamond deposition process.

25. (Amended) The article of claim 23 wherein said [framework material] open-cell foam substrate comprises a material incompatible with a diamond deposition process coated with a material compatible with a diamond deposition process.

28. (Amended) The article of claim 23 wherein said voids [in said article] are at least partially filled with a filler material.

29. (Amended) The article of claim 28 wherein said filler material substantially completely fills said voids [in said article].

32. (Amended) An article comprising diamond deposited on a ceramic framework material substrate, said diamond at least partially coated with a catalytic material.